

# CONSOLIDATED INFORMATION TECHNOLOGY SERVICES TASK ASSIGNMENT (TA)

1. **TITLE:** (D314) Acoustic Analysis Toolset Development, Validation, and Documentation

<b>TA No:</b>	269-Rev3	
<b>Task Area Monitor:</b>	<b>Alternate Task Area Monitor:</b>	None
<b>NASA POC:</b>	<b>Software Control Class:</b>	Low Control
<b>Type of Task:</b>	Recurring Task	

## 2. BACKGROUND

Acoustic Toolset Development/Validation:

The acoustic scattering capabilities within NASA's Aircraft Noise Prediction are simple and only include the effect of shielding. To fully account for all acoustic scattering effects due to the aircraft body, both the shielding and reflection/refraction for arbitrary geometries must be included. The Fast Scattering Code offers this capability. However before it can be included within ANOPP framework, it must be verified, validated and applied to realistic sources/airframe configurations and for frequencies of relevance.

Acoustic Propagation and Emulation Toolset (APET):

APET provides a capability to predict the noise signature and metrics at far-field observers for aircraft in flight given their noise characteristics on a source noise sphere. The effects of the environment as well as flight procedure are included in the resulting observer noise metrics. The capability has limited validation and has been applied to selected aircraft.

ANOPP II self noise prediction:

ANOPP II is the next generation of NASA's system noise prediction capability. Higher fidelity source noise and propagation methods are required in order to analyze future non-conventional and conventional aircraft configurations and flight procedures. The airframe self noise prediction capabilities within ANOPP are limited to empirical turbulent boundary layer trailing edge noise only. The Brooks self noise code coupled with high fidelity CFD (USM3D) will provide an improved capability that is applicable to hybrid wing body aircraft as well as conventional designs. The new capability will include not only trailing edge noise, but bluntness, laminar boundary trailing edge, and tip vortex noise.

DAMAS / DAMAS\_C:

DAMAS and DAMAS\_C are acoustic array data analysis methods that use deconvolution methodologies. DAMAS is applicable to distributions of incoherent acoustic sources while DAMAS\_C is a superset that incorporates spatial source coherence effects in the analysis. The current implementations of DAMAS and DAMAS\_C were developed for demonstration of the method and the resultant research codes have been used in a number of applications. However, to fully develop the codes into a form suitable for production processing, refinements are needed to increase the usability, efficiency and robustness of the software.

### 3. OBJECTIVE

The objectives of this TA are:

(1) to assess and develop a unified capability to integrate acoustic source noise codes, acoustic scattering and propagation analyses for NASA's next generation Aircraft NOise Prediction Program II (ANOPP II). This will include assessing current analyses for airframe noise, acoustic scattering and propagation as well as improving these capabilities for implementation within ANOPP II. Develop an efficient, robust, documented DAMAS capability that can be used for routine processing as well as a research tool for analysis of acoustic sources.

(2) to develop an efficient, robust, documented DAMAS (Deconvolution Approach for the Mapping of Acoustic Sources) and DAMAS\_C (spatial coherence DAMAS) capability that can be used for routine processing as well as a research tool for analysis of acoustic sources.

### 4. GENERAL IT SUPPORT SERVICES

#### **General IT Support Services Performance Metrics**

Performance Standard: Product quality meets customer expectations.

Performance Metrics:

Exceeds: All deliverables are accurate and meet the requirements and acceptance criteria defined per deliverable.

Meets: 90% of deliverables are accurate and meet the requirements and acceptance criteria. Only minor deficiencies are found that are readily correctable within the development schedule.

Fails: Deficiencies are found that will result in schedule delays to correct.

Performance Standard: The contractor delivers products (applications, data, etc.) within costs and schedule.

Performance Metrics:

Exceeds: The contractor delivers products to the customer prior to scheduled delivery date and under cost.

Meets: The contractor delivers products to the customer on scheduled delivery date and within cost.

Fails: The contractor delivers products to the customer after scheduled delivery date and/or exceeds stated cost by more than ten percent.

### 5. SYSTEM AND APPLICATION DEVELOPMENT SERVICES

Project Title: ACOUSTIC TOOLSET DEVELOPMENT/VALIDATION

LaRC Software Manager:

Software Software Control Class: Low

Responsibilities of Contractor and LaRC personnel:See subtask

**Requirements:**

See subtask

**Constraints:**

See subtask

**Acceptance Criteria:**

See subtask

Project Title: DAMAS / DAMAS\_C

LaRC Software Manager:

Software Software Control Class: Low

Responsibilities of Contractor and LaRC personnel:See Subtask

**Requirements:**

See Subtask

**Constraints:**

See Subtask

**Acceptance Criteria:**

See Subtask

## **6. WORK-AREA SPECIFIC SERVICES**

None required.

## **7. Exhibit A**

None required.

## **8. SPECIAL SECURITY REQUIREMENTS**

There are no special security requirements for performing the requirements of this TA.

## **9. SOFTWARE ENGINEERING PROCESS REQUIREMENTS**

Version control of software, documentation and test cases.

## 10. JOINT REVIEW SCHEDULE

No special reviews are required.

## 11. PERIOD OF PERFORMANCE

This TA is effective from 10/01/07 to 04/27/10

## 12. TECHNICAL PERFORMANCE RATING

In evaluating Technical Performance, quality and timeliness shall be rated as follows:

Quality: 50%    Timeliness: 50%

## 13. RESPONSE REQUIREMENTS

This Task Plan shall address the contractor's specific work plans, associated estimated labor hours, cost and schedule.

## 14. GOVERNMENT ESTIMATED COST

## 15. FUNDING INFORMATION

Funding has not been entered for this TA.

## 16. MILESTONES

Date	MileStones
04/27/2010	See Subtasks

## 17. DELIVERABLES

Number	Deliverable Item	Deliverable Schedule
1	See subtasks	as required through 4/27/2010

## 18. FILE ATTACHMENTS

None.